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경제학 석사 학위 논문

# **Trust and Labor Market Participation**

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## **Abstract**

# **Trust and Labor Market Participation**

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This paper investigates the relationship between trust and individuals' labor market participation by using the United States' General Social Survey. This study utilizes instrumental variable and pseudo-panel estimation methods in addition to simple Probit models, which enhances the reliability of results. The findings suggest that trust as an individual's attitude is significantly associated with the probability of the individual's labor market participation, and that the inherited component of trust affects individual's decision to participate in the labor market. The results from the pseudo-panel, constructed by taking the average values of the agegroup cohort within the same region, imply that trust at the regional level, but not at the cohort level, is significantly associated with the proportion of people involved in the labor market in the United States.

Keywords: social capital; trust; labor market outcomes; instrumental variable estimation; pseudo-panel approach

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# 1. Introduction

Ever since the notion of social capital gained attention in the academia, a considerable number of studies in economics have revealed positive impact of trust on economic growth (Algan & Cahuc, 2010; Dearmon & Grier, 2009; Knack & Keefer, 1997). While it is generally agreed that trust has a positive impact on economic development, the underlying mechanism has not been sufficiently disclosed. So far, La Porta et al. (1997) looked at institutions, Zak and Knack (2001) at investments, and Guiso, Sapienza, and Zingales (2004) at financial development, and confirmed that trust promotes economic growth through these factors. However, no studies have examined how trust can influence an individual's decision to participate in the labor market yet.

Considering the importance of trust on various factors pertaining to economic growth, it is a surprising fact that studies on the relationship between trust and labor market participation are lacking, as labor has traditionally been an important determinant of individuals' productivity and income growth in theories of economics. High trust may promote labor market participation because trust reduces the "risk" of being employed. The risk can be regarded as the "perceived" probability of being treated unfairly by the employer, and/or the psychological cost of being employed in a distrusting environment.

This study has drawn insights from previous research on the roles of trust. In higher-trust societies, individuals feel less obligated to invest in protective measures that prevent themselves from being exploited in economic transactions (Knack & Keefer, 1997). Trust also enables parties to coordinate their activities for mutual benefits and to reduce incentives for cheating (Kim & Kang, 2009). In fact, considering that trust decreases

the asymmetric information problem and increases efficiency in information sharing, high trust levels may reduce concerns that the other party will take advantage of asymmetric information or uncertainty (Dearmon & Grier, 2009).

An individual perceives the society's trust level, and makes decisions (including economic ones) accordingly. In Alesina & La Ferrara (2002), they propose that past experience potentially determines trust. For instance, if people live in a trusting environment in which they are used to being treated fairly, they are likely to trust others. Therefore, I conjecture that as trust increases in a society, individuals worry less about being cheated and expect that they will be treated fairly in the labor market, which increases their motivation to participate.

The underlying assumption is that there are three types of people. 1) Those who choose to work regardless of the trust level in their environment, 2) those who choose not to work regardless of the trust level in their environment, and 3) those who change their working status depending on the trust level. These "people at the margin" are the people who would choose not to work in a society with distrust, but who would choose to have jobs in a trusting society. In other words, their value of making money is bigger than doing something else in a trusting environment, but the value of doing something else outpaces monetary values in an environment where distrust is permeating. For example, people in this category prefer to become housewives, students, or even stay unemployed in a distrusting society, but they prefer to work in a trusting society. The reason is that distrust discounts monetary gains from work, which makes non-monetary values become more salient.

In fact, some studies in economics recognize the psychological costs of distrust. Frey and Jegen (2001) mention two psychological

processes, 1) impaired self-determination and 2) impaired self-esteem, when negative external interventions affect intrinsic motivation. In Fehr and Falk (2002), they conduct an experiment that introduces a negative incentive scheme for workers; in case shirking of a worker is identified, a wage deduction is imposed. Workers, viewing the incentive system as a hostile act and a signal of distrust, may no longer put extra effort and even prefer shirking, although the expected cost of shirking exceeds the benefits of shirking. Therefore, comparing the environments with high trust and low trust, given the same amount of monetary rewards (extrinsic motivation), I speculate that intrinsic motivation for work is higher in the society with high trust, which attracts more people to work.

In this paper, I examine the role of trust, which is a widely used proxy for social capital stock, in people's labor market participating decisions. Measuring trust is still an area for debate, but I employ the method introduced in Knack and Keefer (1997), which has been used in many studies. In their cross-country study, a stock of trust is defined as the percentage of people within a country answering that "Most people can be trusted" when asked, "Generally speaking, would you say that most people can be trusted or you can't be too careful in dealing with people?" While Glaeser et al. (2000) criticize that this method is obscure and propose conducting experiments for more accurate predictions, it is a relatively convenient and reliable measure that can be obtained through the existing data. I believe that the above measure of trust fulfills the concept of social capital introduced in Welch et al. (2005), which is 1) connections between people and 2) an individuals' sum total of such connections.

Using primarily the United States' General Social Survey data, I first conduct a Probit analysis to see whether trust affects individuals'

labor market participation decisions. Trust is indeed statistically significantly associated with the probability of participating in the labor market. In order to examine trust's degree of impact, I conduct an instrumental variable estimation by using information on the respondents' ancestors and find that inherited trust plays a significant role. Furthermore, I construct a pseudo-panel out of the GSS data and investigate the relationship by using the fixed effects estimation. The method used by Kim & Kang (2009) is applied for the construction of the pseudo-panel, which is tracking agegroup cohorts in a given region over repeated cross-sectional surveys. I find that trust promotes income growth through the channels of labor by using the following datasets: United States' General Social Survey (GSS), the World Value Survey (WVS) and European Value Survey (EVS) data, and Tanja Ellingsen's Fragmentation Data.

In the following section, I review the literature on trust and on the relationship between social capital and labor market outcomes. In Section 3, I explain the datasets used for the analyses in the paper in detail. Section 4 presents empirical strategy, and Section 5 reports the main results of the effects of trust on people's labor market status obtained through several econometric techniques. Section 6 concludes.

## 2. Literature Review

### 2.1 Trust as a Measure of Social Capital

Among various measures of social capital, why do I focus on trust? First, it has been recognized as an essential factor of economic activities (Arrow, 1972; Ferrary, 2003; Francis Fukuyama, 1995; Knack & Keefer, 1997; La Porta et al., 1997). Several studies have attempted to reveal the underlying mechanisms from trust to economic growth.

For example, La Porta et al. (1997) examine the impact of trust on the performance of large organizations, which is measured by government effectiveness, participation in civic organizations, and size of the largest firms relative to GNP. They find that, in large organizations such as the government or civic associations, trust is essential for good performance.<sup>1</sup> Den Butter & Mosch (2003) find that there is a positive association between trust and bilateral trade as trust lowers transaction costs. Rather than focusing on physical distance, they focus on cultural and institutional distances, implying that different cultural background may discourage trade between regions and people. They estimate that a one standard deviation rise in trust is associated with more than 100 percent increase in the value of bilateral trade. Guiso, Sapienza, and Zingales (2004) study the effect of trust on financial development in Italy. They find that trust plays an important and positive role in financial development, which is measured by the probability of using checks, the proportion of wealth a household invests in cash, the proportion of financial wealth invested in stock, and the probability of buying stocks. Specifically, they find that trust statistically significantly increases the probability of using checks,

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<sup>1</sup> They measure civic participation with the percentage of civic activities in which an average individual participates and government efficiency with four proxies (judiciary efficiency, corruption, bureaucratic quality, and tax compliance).

has a negative and highly statistically significant effect on the proportion of wealth a household invests in cash, and has a statistically positive effect on the proportion of financial wealth invested in stock. In their later study, Guiso, Sapienza, and Zingales (2008) find out that trust plays an important role in raising the probability of buying stocks.

Second, trust is one of the most important determinants of social capital. Researchers on social capital agree that trust is one of social capital's main elements. For example, Fukuyama (1995) considers trust, strong family ties, strong associations outside of kinship, and culture as elements of social capital. Portes (1998), defining social capital as "the ability of actors to secure benefits by virtue of membership in social networks or other social structures," recognizes trust, social contacts and networks as sources of social capital.

Nevertheless, trust is at the core of the concept of social capital. Many significant studies treat social capital and trust as synonymous (Arrow, 1972; Glaeser et al., 2000; Putnam, 1995). Welch et al. (2005) express trust as a building block of social solidarity, cooperation, solidarity, and altruism. Furthermore, they argue that trust enhances workers' job performance and satisfaction, which leads to increased morale, productivity, and profitability of the organization. In economics, it is well-accepted that trust reduces uncertainty and risk in market transactions. Trust is an important factor that enables successful interpersonal transactions among strangers or unacquainted people (La Porta et al., 1997; Welch et al., 2005).

## 2.2 Social Capital and the Labor Market

There indeed exist scholarly evidences that social capital has a significant influence on a person's labor market participating decisions. However, studies so far have used proxies and concepts of social capital other than trust--such as social contacts and networks, as mentioned in the subsection above--to find out the relationship between labor market participation and social capital. Nevertheless, it is worth going over some of the important hypotheses regarding this issue.

The role of social capital in an individual's labor market participation decisions goes back as far as Granovetter's concept of Strength of Weak Ties (1973).<sup>2</sup> He argues that many job seekers get employed by utilizing their social contacts rather than only formal channels, and that a job found through social contacts results in higher wages and job satisfaction. His logic is that as social interaction transmits information, details about people and jobs flow through social networks. The already established social connections lower search costs for recruitment. Here, weak ties are more useful than strong ties because acquaintances are less redundant and less similar to us than close friends, and they connect us to a wider world. Granovetter (1995) finds evidence that the large majority of nonsearchers (i.e. people who land in jobs without searching for one) found jobs through personal contacts. Also, there is evidence that those entering a firm through social contacts have lower quit rates, even after controlling for ability or quality of worker (Granovetter, 2005).

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<sup>2</sup> Granovetter's definition of the strength of an interpersonal tie is "a combination of the amount of time, the emotional intensity, the intimacy (mutual confiding) and the reciprocal services that characterize the tie" (Granovetter, 1973). For example, strong ties refer to close friends and immediate family and weak ties refer to acquaintances.

Franzen and Hangartner (2006) raise questions to two of Granovetter's arguments; 1) jobs found through social contacts are better paid and more satisfying, and 2) weak ties are better than strong ties. Instead, they take in Montgomery (1992)'s view that the expected wage from weak-tie offers may be lower than the wage expected from strong-tie offers, and argue that wages do not differ whether the job was found through weak ties or strong ties. Using the data on social relations and support systems (ISSP 2001) and on Swiss university graduates, they find that finding a job through the network has non-monetary advantages for labor market entrances.

Ioannides and Loury (2004) summarize the findings of the first generation of empirical work on job information networks. 1) There is increasingly widespread use of friends, relatives, and acquaintances to search for jobs, 2) such use often varies by location and by demographic characteristics, 3) job search through friends and relatives yields more offers per contact, 4) the part of the variation in the productivity of job search by demographic group reflects differences in usage of contacts, 5) many differences in productivity of job search by age, gender, race and ethnic group cannot be completely accounted for by differences in usage.

Aguilera and Massey (2003) find a positive association between social capital (measured by interpersonal connections) and wages among Mexican immigrants in the US. For undocumented migrants, in particular, the probability of getting a job through friends or relatives is higher than their legal counterparts. They imply that workers facing employment barriers (e.g. legal restrictions, discrimination, and structural constraints) can utilize social capital to circumvent these barriers. Borghans, Ter Weel, and Weinberg (2006) find that people skills, measured by work

adaptability and personality traits, are important in determining labor market outcomes, including wages and occupations.

Not all studies view social capital positively in affecting labor market outcomes. They regard investments in social capital and investments in labor as substitutes. For example, they argue that the more people invest in spending time with family, the less time/effort they spend at work. Algan et al. (2010) argue that countries with strong family ties prefer rigid labor market conditions because moving away from home is costly. Therefore, low efficiency and employment are the tradeoffs for benefits of strong family ties. Bartolini and Bilancini (2011) investigate the relationship between social participation and the number of hours worked. As social capital and private consumptions are partial substitutes, economic growth generates negative externality that reduces social capital, and individuals force themselves to rely on material goods to maintain their well-being, which results in long working hours and increased output.

Costa and Kahn (2003) also recognize a trade-off between social hours and working hours, but the evidences that these studies bring are not sufficient to prove that individuals reduce hours to socialize due to increased hours at work. In fact, Aguiar and Hurst (2007) find evidence that Americans have enjoyed more leisure while keeping hours at work relatively constant over the few decades. Moreover, those who view work and sociability as substitutes do not take into account personality differences. For example, individuals with long working hours may engage in more civic activities because they are more ambitious (Rupasingha et al, 2006; Saffer and Lamiraud, 2008). In fact, Rupasingha et al. (2006) find evidence that employed women actually participate more

in Putnam groups and less in Olson groups<sup>3</sup>. Saffer and Lamiraud (2008) use a natural experimental setting, which is the enactment of a French law in 1998 that reduced the legal number of weekly working hours from 39 to 35, and find that reduced working hours do not affect the hours used for social interactions.

The above studies on social capital and labor market outcomes use social contacts/networks as proxies for social capital. However, as mentioned in the earlier sub-section, no attempts have been made, to my best knowledge, to investigate the relationship between trust, the most important factor constituting social capital, and labor market outcomes. In this paper, I hope to contribute to the current debate on social capital and labor market by utilizing trust, a more convenient and widely used measure of social capital, as a proxy for social capital.

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<sup>3</sup> Putnam views that cooperation among members of a group creates habits and attitudes toward serving the greater good that leads to members' interactions with non-members (e.g. religious organizations, education and cultural groups, youth groups). On the other hand, Olson views that cooperation within a particular group with the purpose of raising the welfare of members of the group can worsen the welfare of non-members (e.g. lobbyists, labor unions, political parties, professional associations).

### 3. Data

The main dataset I use is from the United States' General Social Survey, which has been conducted across the U.S. almost every other year from 1972 to 2010. The subjects were aged 18 or more living in non-institutionalized residences. From 1972 to 2004, the target population was English-speakers only and from 2006 onward, Spanish-speakers was added. Each survey contains more than 1,500 completed interviews, reaching 55,087 interviews in total. This study uses the cumulative data file, provided by National Opinion Research Center, which is obtained by merging all 28 General Social Surveys.<sup>4</sup> The survey contains questions on demographics, family, income, working status, religion, attitudes and perceptions on the society, etc. As most people in the United States are descendants of immigrants or immigrants themselves, the survey also contains information on country of the respondents' ancestors.

Using this information of the GSS, I linked the ancestors' country to the country data of WVS and EVS in order to create proxies for the respondents' trust. The WVS has been conducted five times, in 1981, 1990, 1995, 2000, and 2005, in 87 countries across the world, and the EVS has been conducted four times, in 1981, 1990, 1999, and 2008 in 49 countries, mainly in Europe. Both Surveys have 1000 to 1500 randomly selected adults in each of the countries. As these two dataset share core variables and complement each other in terms of geographic coverage, hereafter I will refer to the merged version of these data as Value Surveys (VS). Based on the VS, I set the first waves' trust level of an individual's ancestor's country—as earlier data are not available—as the proxy for individual's inherited trust. For example, if an individual's ancestors are

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<sup>4</sup> Specifically, the survey years are 1972-1978, 1980, 1982-91, 1993, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, and 2010.

from Italy, I use the trust level of Italy in 1981 as the proxy for the individual's trust level. As the trust level can be affected by the degree of economic prosperity of the country, I also create a proxy for trust that equals the residual values after regressing trust and GDP per capita (obtained from World Bank data) of the country.

The above approach of using one's trust stock as the trust level of one's country of origin is based on the evidence that parents' social capital is a good predictor of children's social capital (Rice and Feldman, 1997; Guiso, Sapienza and Zingales, 2006) and that people tend to apply the trust of the environment in which they are born to the new environment in which they live (Osili and Paulson, 2008; Guiso, Sapienza, and Zingales, 2004; Guiso, Sapienza, and Zingales, 2008). Guiso, Sapienza, and Zingales (2006) find that the origin of ancestors has a significant effect on trust, meaning that the effect of trust is strong when ancestors come from high-trusting countries today. Therefore, the trust of the immigrants would partly be composed of the trust level of their home countries, and the descendants of the immigrants would inherit their ancestors' level of trust.

In fact, Algan and Cahuc (2010) reveal the causal effect of trust on economic development by trying to control for specific invariant national or regional factors. They avoid reverse causality between trust and economic development by focusing on the inherited component of trust, which precedes economic development. Using the trust of US descendants whose parents were/are immigrants, they find that the inherited component of trust has a significant effect on economic development.

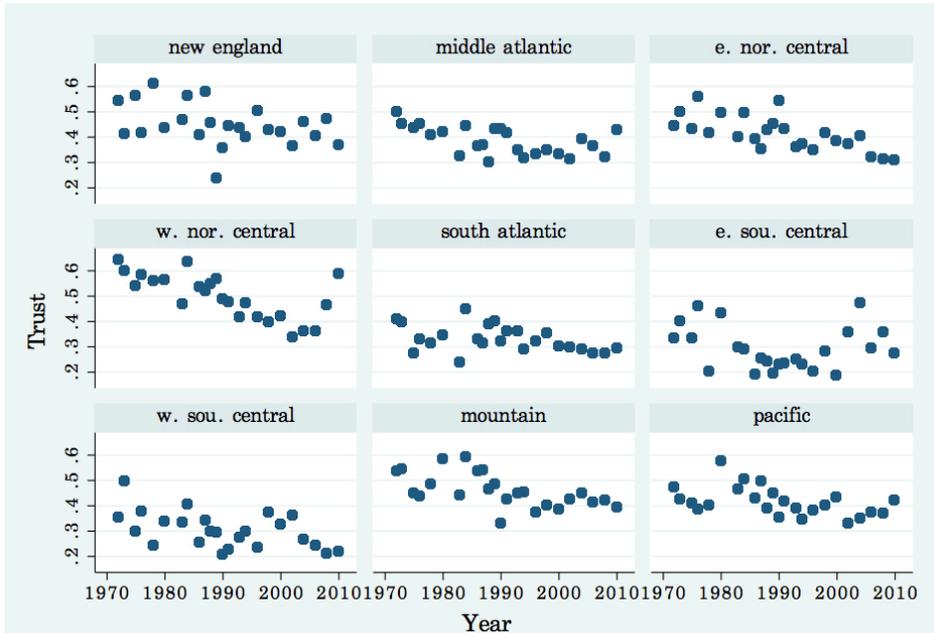
In addition, there are evidences that culture (defined by religion and ethnicity) affects prior beliefs about trust (Guiso, Sapienza, and Zingales, 2006). Using this evidence, I merge the countries' degree of ethnic, linguistic, and religious fractionalization obtained from the

Fragmentation Data into the trust and economic variables obtained from the VS and the World Bank datasets. Compiled by Tanja Ellingsen, the Fragmentation dataset measures the degree of ethnic, linguistic and religious heterogeneity in the countries worldwide based on *Handbook of the Nations*, *Britannica Book of the Year*, and *Demographic Yearbook*. The degree of fragmentation of ancestors' countries serves as instruments for trust of ancestors' countries.

After merging all of the datasets above, I construct a pseudo-panel by identifying individuals belonging to the same age group within a region, by averaging the values of individual variables over a five-year interval. I include individuals aged between 18 and 65 only, as those outside this range participate significantly less in the labor market due to their distinctive characteristics. Except for the youngest agegroup (from 18 to 20), each agegroup is formed by dividing age at a five-year interval (from 21 to 25, from 26 to 30, and so on).

Because of the sensitivity issues, the GSS data do not provide the respondent's state of residence. Instead, their residence is coded at the region-level. A region encompasses several states and the U.S. is divided into nine regions, as specified in Appendix A1. This may be one of the limitations of my paper since region covers an area too big to measure trust at the community level. Nevertheless, it is a useful measure of individuals' trust stock as the variations of trust across regions are still considerable, as shown in Figure 1.

**Figure 1. Trust Trends by Region**



Note: The vertical axis indicates the proportion of people who answered “Most people can be trusted” in the region. Refer to Appendix A1 for states and regions in detail.

Table 1 shows the respondents’ or their ancestors’ countries of origin obtained from the GSS data. Unfortunately, the information on the specific country of origin is not available for those from Africa. Therefore, I treat Africa as a country and obtain its trust level by averaging the African countries’ trust levels in the VS data. The table reports figures in percentage of people who responded that “Most people can be trusted” from the GSS and from the VS, respectively. For example, 16.72% of those who have ancestral origins in Africa among the GSS respondents trust most people, and 14.75% of those in the African countries that participated in the VS survey answered that they trust most people. We can see that the values in the two surveys are similar ( $\rho=0.56$ ). This implies that people inherit a considerable part of trust from their originating countries, as proven in the previous studies.

**Table 1. The Originating Countries of the Respondents' Ancestors**

Country of family origin	N	"Trust most people"	
		GSS	VS
Africa	3526	16.72	14.75
Austria	181	40.35	28.36
Canada	682	41.12	47.05
China	201	42.98	59.40
Czech Republic	462	44.90	27.78
Denmark	268	52.30	47.21
United Kingdom	5643	50.21	29.09
Finland	168	54.90	56.03
France	787	45.99	23.08
Germany	6311	44.09	26.82
Greece	171	39.29	20.49
Hungary	223	44.00	32.31
Ireland	4333	44.93	39.52
Italy	2090	39.28	25.89
Japan	122	41.56	37.87
Mexico	1636	22.97	16.88
Netherlands	551	42.42	39.31
Norway	663	55.58	55.47
Philippines	197	20.83	5.50
Poland	1066	43.04	31.34
Puerto Rico	451	15.44	5.93
Russian Federation	525	47.15	34.73
Spain	395	31.76	32.91
Sweden	595	52.45	52.10
Switzerland	149	56.60	26.29
India	191	33.83	33.52
Portugal	126	32.95	21.01
Lithuania	96	42.86	30.80
Slovenia	142	46.91	16.33
Romania	58	31.58	15.78
Belgium	69	53.66	25.50
Saudi Arabia	86	37.04	50.53
United States	2730	24.31	39.35

Note: In the GSS, the United Kingdom and Canada were categorized into smaller units. The people whose ancestral countries were England, Wales and Scotland were assigned the UK's trust value, the people with ancestral origins of Canada were assigned Canada's trust, and those with American origins (who indicated America or American Indians) were assigned the US' trust value. I did not assign any trust level to those who indicated that their ancestral origins are the variations of "Other," or "West Indies," as identifying their countries was impossible. I assigned the trust level of Czech Republic to those who indicated that they were from Czechoslovakia, and the trust level of Slovenia to those who indicated that they were from Yugoslavia.

## 4. Empirical Strategy

The impact of trust on individuals' labor market participation decision can be expressed as the following equation

$$(1) \quad D_{irt} = \alpha_0 + \alpha_1 S_{rt} + \alpha_2 X_{irt} + F_r + F_t + \varepsilon_{irt}$$

where  $D_{irt}$  stands for the individual  $i$ 's labor market participation status in region  $r$  at year  $t$ . The variable  $S_{rt}$  measures the region mean of trust of individuals who live in region  $r$  at year  $t$ , and  $X_{irt}$  is the vector of individual characteristics such as age, sex, years of education, income, marital status, and spouse's labor market participation status.  $F_r$  stands for region fixed effects,  $F_t$  stands for year fixed effects common to all regions, and  $\varepsilon_{irt}$  is an error term. We are interested in the true value of  $\alpha_1$ .

However, equation (1) is exposed to the problem of endogeneity as trust can be correlated with the unobserved error term  $\varepsilon_{irt}$ . Algan and Cahuc (2010) deals with this issue by separating the contemporaneous and the inherited components of trust. Their assumption is that current trust is determined by all factors which are likely to influence economic performance and by the previous generations' level of trust, and that the previous generations' trust is excluded from the equation (1) so that  $\varepsilon_{irt} \perp S_{rt-1}$ . Applying their model, we derive the following model:

$$(2) \quad S_{rt} = \gamma_0 + \gamma_1 S_{rt-1} + \gamma_2 Z_{rt} + \Phi_r + \Phi_t + v_{rt}$$

where  $S_{rt-1}$  denotes the region mean of trust of the previous generation in period  $t-1$ ,  $Z_{rt}$  denotes a vector of time varying characteristics of the region and  $v_{rt}$  is an error term. However, rather than trying to estimate

equation (2) as in Algan and Cahuc (2010), in this paper, I would like to carry over their insight that there is an inherited component of trust into the instrumental variable estimation.

The proxy for inherited trust of people in region  $r$  is the average value of trust of the country that individuals' ancestors emigrated from and is obtained from the VS. Since the earliest wave of VS is 1981, I use the trust value in 1981 to proxy for individual's inherited trust. As trust has been proven to be associated with economic development, I use the residual value after regressing trust on GDP per capita (as mentioned in Section 3 in detail) as the proxy for trust in the instrumental variable estimation.

The second stage of the instrumental variable estimation is specified in Equation (3),

$$(3) \quad D_{irt} = \beta_0 + \beta_1 S_{ict-1} + \beta_2 X_{irt} + \omega_{irt}$$

where  $D_{irt}$  stands for the individual  $i$ 's labor market participation status in region  $r$  at year  $t$ . The variable  $S_{ict-1}$  denotes the residual values of trust of individual  $i$ 's ancestors who lived in country  $c$  at  $t-1$ ,  $X_{irt}$  is the vector of individual controls, and  $\omega_{irt}$  is the error term.

The first stage of the instrumental variable estimation is specified in Equation (4),

$$(4) \quad S_{ict-1} = \delta_0 + \delta_1 I_{ict-1} + \eta_{irt}$$

where  $I_{ict-1}$  denotes the vector of the fragmentation variables of the country  $c$  at time  $t-1$ ' (which does not necessarily coincide with  $t-1$  due to data) and  $\eta_{irt}$  is the error term.

After analyzing data at the individual level, I transform the dataset into a pseudo-panel in order to obtain more accurate estimates. The specification of the pseudo-panel is as follows,

$$(5) \quad L_{jrt} = \theta_0 + \theta_1 T_{jrt} + \theta_2 X_{jrt} + \zeta_{jrt}$$

where subscripts  $j$ ,  $r$ , and  $t$  denote cohort, region, and year, respectively.  $L_{jrt}$  denotes the share of employed in cohort  $j$  in region  $r$  in year  $t$ .  $T_{jrt}$  is the share of those who trust most people in cohort  $j$  in region  $r$  in year  $t$ ,  $X_{jrt}$  is the vector of cohort controls and  $\zeta_{jrt}$  is the error term.

Since it may be a stretch to think that an individual is affected by the trust stock of agegroup, rather than the trust of community regardless of age, in making a decision on the labor market participation, I also conduct analyses using  $T_{rt}$  instead of  $T_{jrt}$  to check how the results change.

## 5. Estimation Results

I first examine the effect of trust either as a stock (i.e. the proportion of people in the region who answered that they can trust most people) or as an attitude (i.e. whether the individual trust most people or not) on the individual's labor market participation decision. Table 2 reports the results from Probit estimation. Column (1)-(2) present the regression results when the variable of trust is defined as a stock, and Column (3)-(6) present the results when the variable of trust is an indicator variable. The dependent variable is a dummy variable that equals 1 if the individual works either full-time or part-time, or if the individual is taking a break due to illness, strike or other reasons. The dummy is zero if the respondents indicated their working status as students, keeping house, unemployed, or "other."<sup>5</sup> The control variables include the respondent's age, sex, years of education, marital status, number of children, spouse's working status, and race. In order to control for the region's demand side of the labor market, I add the region's annual average unemployment rates as a control variable.

Although Column (1) and (2) report positive and significant coefficient for trust, the variable used in the regression, the regional level of trust, may seem problematic since the variable has only 9 distinct values for the entire individual observations for the specific year. Therefore, I would like to focus on the results in Column (3)-(6) where the trust variable is the indicator variable of an individual's attitude. Although this may not be a stock variable, it is nonetheless a meaningful indicator that reflects trust. The results in Column (3) tell us that when an individual

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<sup>5</sup> Even if I exclusively set the control group as those who indicated their work status as "unemployed," the regression results do not differ significantly. For descriptive statistics, refer to Appendix A3.

has trusting attitude, he/she is 3% more likely to participate in the labor market, given other controls at the mean value (refer to Appendix A4 for the marginal effect value of trust). Trust, whether as a stock or an attitude, seems to be significantly associated with an individual's decision to participate in the labor market.

To see whether trust exerts different degrees of influence on men and women, I include an interaction term (Trust\*male) in Column (5). The coefficient value (-0.023) is statistically insignificant but negative, implying that the effect of trust may be bigger for women in making decisions on labor market participation, since men generally face a higher pressure to work as main breadwinners in the family.

Since attitude of an individual may depend on his/her personality which again can affect the participation status, I add another variable, perceived fairness, that can possibly control for such individual characteristics. The variable is an indicator variable equal to 1 if the respondent answered that people try to be fair and 0 otherwise, when asked "Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?" Column (4) presents the results after adding the fairness variable, which does not significantly alter results compared to those in Column (3).

**Table 2. The Effect of Trust on Labor Market Participation:  
Probit Results**

	(1)	(2)	(3)	(4)	(5)	(6)
Trust	0.302* (1.873)	0.406** (2.061)	0.104*** (5.194)	0.0872*** (3.933)	0.113*** (4.512)	0.121*** (5.061)
Fairness		0.0572*** (2.953)		0.0272 (1.297)		
Age	0.150*** (35.94)	0.152*** (29.92)	0.151*** (30.50)	0.152*** (29.45)	0.151*** (30.48)	0.115*** (19.03)
Age <sup>2</sup>	-0.0019*** (-37.87)	-0.0019*** (-31.53)	-0.0019*** (-32.21)	-0.0019*** (-31.10)	-0.0019*** (-32.19)	-0.0015*** (-20.93)
Sex	0.555*** (35.02)	0.597*** (30.80)	0.568*** (30.26)	0.587*** (29.77)	0.576*** (25.08)	0.573*** (24.86)
Trust*male					-0.0229 (-0.594)	
Education	0.0758*** (26.96)	0.0784*** (22.28)	0.0748*** (21.88)	0.0760*** (20.99)	0.0749*** (21.89)	0.0775*** (18.01)
Marital status	-0.0406* (-1.692)	-0.0289 (-0.994)	-0.0147 (-0.518)	-0.0213 (-0.718)	-0.0143 (-0.504)	0.153*** (4.248)
Children	-0.0601*** (-11.36)	-0.0606*** (-9.523)	-0.0598*** (-9.621)	-0.0597*** (-9.222)	-0.0597*** (-9.602)	-0.0626*** (-8.252)
Spouse's work status	0.0461* (1.919)	0.0138 (0.478)	0.00895 (0.316)	0.00928 (0.314)	0.00842 (0.297)	0.240*** (7.006)
Other race	-0.0438 (-1.369)	-0.0153 (-0.364)	-0.0176 (-0.452)	-0.00820 (-0.193)	-0.0177 (-0.454)	-0.0254 (-0.536)
Black	-0.141*** (-6.405)	-0.125*** (-4.582)	-0.141*** (-5.337)	-0.119*** (-4.292)	-0.140*** (-5.323)	-0.138*** (-4.151)
Unemployment rate	-0.0151 (-1.481)	-0.00759 (-0.676)	-0.00835 (-0.735)	-0.00812 (-0.703)	-0.00836 (-0.735)	-0.0256* (-1.899)
Log family income						-0.0402*** (-3.714)
Constant	-3.354*** (-21.74)	-3.560*** (-19.67)	-3.319*** (-21.21)	-3.381*** (-21.00)	-3.321*** (-21.22)	-2.349*** (-11.16)
Observations	35,998	24,359	25,822	23,617	25,822	16,566

z-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: The dependent variable is a dummy variable indicating the respondent's work status. Region and year dummies were included in the regressions but their coefficients are not reported in the table. Sex is a dummy variable that equals 1 when the respondent is male, marital status is a dummy variable that equals 1 when the respondent is married, spouse's work status is a dummy variable that equals 1 when the respondent's spouse works full-time/part-time or is on break, other race, and black are dummy variables indicating the respondent's race. Unemployment rate is the region's annual average unemployment rate.

I exclude the income variable in the regression because the GSS does not provide the information on the exact income in monetary units, but it is coded into a categorical value. Therefore, the income variable I use is an imputed value which does not reflect the variation within the same income category. Nevertheless, even after adding the log of annual family income (after removing the respondent's income) variable in the regression, the trust variable has a statistically significant coefficient (Column 6).

In order to reveal causality between trust and labor market participation, I employ instruments for the trust proxy, which is the trust level in ancestors' country that is orthogonal of the country's economic influence (see Section 3 for more detail). Here, I use a proxy for trust that is different from the ones used for the Probit estimation due to the following reasons; 1) The trust level of ancestors' country maintains the characteristics of "stock" as opposed to the indicator variable used in the previous regression. 2) Compared to the region-level trust, it offers much more variations across individuals as the number of originating countries (as seen in Table 1) is bigger than the number of regions (as seen in Appendix A1).

Since I have information on the individuals' ancestral country (from the GSS) and on the countries' trust level and GDP (from the VS and the World Bank, respectively), I can assign the "inherited" component of trust to individuals. The instruments used for inherited trust are the degree of religious, ethnic, and linguistic fragmentation of the country. As seen in Table 3, we see a statistically significant coefficient of the trust level of the country of origin. The instruments pass the relevance test with the Wald-statistics of 11.79.

Compared to the results in Table 1 and 2, the coefficient of trust is much larger than when measured by the region stock but similar when measured by the individual's attitude. Since Column (1) in Table 1 and the IV regression both use trust stocks, I will compare these two as an example. Given other controls at the mean level, an increase in the trust level by 1 SD (0.08) leads to 0.77% higher probability of being employed (Column (1) in Table 2). On the other hand, the results of Table 3 tell us that a 1 SD (0.09) increase in trust level of home country leads to 2.7% higher probability of being employed, given other controls at the mean level (refer to Appendix A4 for marginal effects). Perhaps an individual's decision to work depends much more on the values created over a long span of time, such as inherited trust from ancestors, rather than trust level at the moment. While it is difficult to delve into the origins of trust—how and when trust is formed, it is clear that even the inherited component of trust exerts significant influence on individual's decision to work.

**Table 3. The Effect of Inherited Trust: IV Estimation Results**

<b>Second stage results</b>	
Trust	0.968*** (3.026)
Age	0.151*** (32.75)
Age <sup>2</sup>	-0.00187*** (-34.63)
Sex	0.560*** (32.36)
Education	0.0718*** (22.55)
Marital status	-0.0500* (-1.915)
Children	-0.0585*** (-10.19)
Spouse' work status	0.0152 (0.585)
Other race	-0.00994 (-0.266)
Black	-0.0767** (-2.445)
Unemployment rate	-0.0175* (-1.700)
Constant	-3.169*** (-22.22)
Observations	29,957

z-statistics in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: The dependent variable is a dummy variable indicating the respondent's work status. Region and year dummies were included in the regressions but their coefficients are not reported in the table. Sex is a dummy variable that equals 1 when the respondent is male, marital status is a dummy variable that equals 1 when the respondent is married, spouse's work status is a dummy variable that equals 1 when the respondent's spouse works full-time/part-time or is on break, other race, and black are dummy variables indicating the respondent's race. Unemployment rate is the region's annual average unemployment rate.

### First stage results

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Age	0.000646** (2.469)
Age <sup>2</sup>	-4.99e-06 (-1.623)
Sex	-0.00153 (-1.635)
Education	0.00143*** (8.309)
Marital status	-0.00163 (-1.130)
Children	-0.000291 (-0.885)
Spouse's work status	0.000882 (0.620)
Other race	-0.000424 (-0.194)
Black	-0.0450*** (-23.09)
Unemployment rate	-0.000401 (-0.695)
Ethnicity	-0.0304*** (-7.488)
Language	0.00484 (1.212)
Religion	-0.108*** (-52.69)
Constant	0.0519*** (6.403)
Observations	29,957

z-statistics in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Wald test of exogeneity:  $\chi^2(1) = 11.79$       Prob >  $\chi^2 = 0.0006$

Note: The dependent variable is the trust level after eliminating the influence of GDP per capita of the ancestral country. Region and year dummies were included in the regressions but their coefficients are not reported in the table. Ethnicity, language, and religion are the variables that indicate degrees of ethnic, linguistic, and religious heterogeneity of the ancestral country.

In order to find a stronger evidence for my hypothesis that trust affects people's intrinsic motivation to work, which affects their labor market outcomes, I examined whether trust has a different impact on prime-age (from 24 to 54) male respondents. Since social and cultural norms tend to force prime-age males into labor market regardless of their motivation, trust has to have a smaller impact for people in this category. In Table 4, I added interaction terms in order to examine the difference in impact of trust on females, prime-age male workers, and non-prime age male workers. Column (1) presents the results of simple Probit estimation, and Column (2) reports the results of IV estimation using the same instrumental variables as in Table 3. The interaction term (Trust\* prime) captures the difference between prime-age male respondents and non-prime age male respondents, and it has mixed results depending on the specification. The Probit estimation yields a positive association, meaning that prime-age males tend to be more heavily influenced by trust, which contradicts my hypothesis. However, the IV results present a statistically insignificant but negative coefficient, implying that prime-age male respondents are less exposed to the effect of trust after using the IV strategy which is generally a better tool in the presence of the endogeneity bias. The interaction term, Trust\*male, which captures the difference between non-prime age male respondents and female respondents has negative coefficients for both Probit regression and IV regression results. This implies that female respondents are more sensitive to the effect of trust than non-prime age male respondents. Although the IV estimation may not entirely resolve the endogeneity issue, at least the results insinuate that trust exerts different degrees of impact on marginal and prime-age workers, which calls for further research.

**Table 4. The Effect of Trust: Probit and IV Results**

	(1)	(2)
Trust	0.112*** (4.506)	1.825*** (3.289)
Age	0.132*** (23.02)	0.128*** (23.87)
Age <sup>2</sup>	-0.00164*** (-23.92)	-0.00159*** (-24.86)
Sex	0.476*** (13.56)	0.385*** (14.28)
Prime age	0.154*** (3.676)	0.268*** (8.169)
Trust*male	-0.142*** (-2.672)	-1.897*** (-3.229)
Trust*prime	0.209*** (3.361)	-0.113 (-0.355)
Education	0.0752*** (21.92)	0.0723*** (22.69)
Married	-0.0231 (-0.812)	-0.0613** (-2.346)
Children	-0.0585*** (-9.401)	-0.0571*** (-9.932)
Spouse' work status	0.0202 (0.708)	0.0274 (1.053)
Other race	-0.0167 (-0.428)	0.000808 (0.0216)
Black	-0.139*** (-5.293)	-0.0763** (-2.397)
Unemployment rate	-0.00853 (-0.749)	-0.0176* (-1.709)
Constant	-2.985*** (-18.07)	-2.760*** (-18.29)
Observations	25,822	29,957

z-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: The dependent variable for Column (1) is a dummy variable indicating the respondent's work status. Column (2) is the second stage results for the IV regression (refer to Appedix A6 for the first stage results). The dependent variable for Column (2) is the trust level after eliminating the influence of GDP per capita of the ancestral country. Region and year dummies were included in the regressions but their coefficients are not reported in the table. Ethnicity, language, and religion are the variables that indicate degrees of ethnic, linguistic, and religious heterogeneity of the ancestral country.

So far we have seen results at the individual level, and now we move on to a pseudo-panel analysis. According to Kim and Kang (2009), the pseudo-panel approach has several advantages. First, it reduces measurement errors that are problematic in empirical investigation, since it uses the mean of cohorts. Second, it helps deal with subjective variables (i.e. the variables depending on the perceptions of members of the community) such as trust. Since an individual's decision to participate in the labor market can be influenced by the degree of perceived importance of trust, taking the mean value of trust within cohort may deviate less.

After constructing the pseudo-panel, the average observations in each cohort are 585 persons. Column 1 and 2 in Table 5 contain regression results of the OLS estimation with the pseudo-panel data. Here, all variables are the mean values at the cohort level. For example, the trust variable is the proportion of people trusting most people within the cohort, and the education variable is the cohort's average years of education that people completed. Here, we see that the coefficient is insignificant and nearly zero for trust (Column 1 and 2). However, when we take the mean value of the region for trust (Column 3 and 4), the association turns to be positive and significant. Adding Fairness variable does not alter the results significantly.

The mean value of trust at the cohort level is insignificantly associated with an individual's labor market participation, but the region-mean value of trust is significantly associated. Comparing the two results, I lean toward using the regional mean value of trust because trust shared with people (regardless of age), rather than trust shared among those in the same agegroup (maximum 4 years of difference), is likely to influence an individual's decision to participate in the labor market. For instance, a student is more likely to be influenced by the trust level of its

community—such as, city—than by the trust level of her friends when faced with a decision whether to work or not after college.

**Table 5. Trust at the Region-level and at the Cohort-level:  
Pooled OLS Estimation**

	(1)	(2)	(3)	(4)
Trust	-0.0165 (-0.537)	-0.00799 (-0.250)	0.188* (1.901)	0.197** (1.988)
Fairness		-0.0177 (-1.046)		-0.0211 (-1.289)
Age	0.0525*** (15.29)	0.0527*** (15.33)	0.0528*** (15.41)	0.0531*** (15.47)
Age <sup>2</sup>	-0.000622*** (-16.37)	-0.000623*** (-16.40)	-0.000627*** (-16.51)	-0.000628*** (-16.54)
Sex	0.219*** (5.672)	0.219*** (5.661)	0.214*** (5.561)	0.214*** (5.575)
Marital status	-0.0312 (-0.629)	-0.0335 (-0.674)	-0.0289 (-0.585)	-0.0333 (-0.673)
Education	0.0235*** (4.522)	0.0243*** (4.628)	0.0221*** (4.279)	0.0233*** (4.436)
Spouse's work status	0.0812 (1.551)	0.0824 (1.575)	0.0797 (1.533)	0.0829 (1.594)
Whites	-0.0564 (-0.741)	-0.0590 (-0.775)	-0.0618 (-0.819)	-0.0620 (-0.822)
Blacks	-0.0260 (-0.293)	-0.0345 (-0.388)	-0.0145 (-0.164)	-0.0234 (-0.264)
Children	-0.0401*** (-4.165)	-0.0398*** (-4.134)	-0.0419*** (-4.406)	-0.0411*** (-4.315)
Constant	-0.606*** (-6.937)	-0.600*** (-6.856)	-0.695*** (-6.991)	-0.694*** (-6.982)
Observations	720	720	720	720
R-squared	0.679	0.680	0.681	0.682

t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: The dependent variable is the proportion of people in the cohort participating in the labor market. Region and year dummies were included in the regressions but their coefficients are not reported in the table.

Fixed effects estimation with the pseudo-panel data yields similar results (Table 6). Here, I used a three-way fixed effect model, which takes into account both region and agegroup fixed effects. Using the cohort's mean of trust provides insignificant and nearly zero coefficient (Column 1). On the other hand, using the region-mean of trust provides significant and positive coefficient (Column 2).<sup>6</sup>

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<sup>6</sup> The coefficient stays significant and becomes slightly bigger when the variable indicating the proportion of people who believe that they are treated fairly is added.

**Table 6. Trust at the Region-level and at the Cohort-level:**

	<b>Fixed Effects Estimation</b>	
	(1)	(2)
Trust	0.00592	0.190**
	(0.184)	(2.009)
Sex	0.229***	0.226***
	(5.879)	(5.831)
Marital status	-0.0194	-0.0225
	(-0.339)	(-0.394)
Children	-0.0310***	-0.0317***
	(-3.231)	(-3.339)
Education	0.0176***	0.0165***
	(3.030)	(2.867)
Spouse's work status	0.0243	0.0282
	(0.440)	(0.511)
Whites	-0.0592	-0.0576
	(-0.781)	(-0.766)
Blacks	-0.0349	-0.0204
	(-0.392)	(-0.229)
Constant	0.409***	0.336***
	(4.189)	(3.261)
Observations	720	720
R-squared	0.308	0.312
Number of s	90	90

t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: The dependent variable is the proportion of people in the cohort participating in the labor market. Region, agegroup and year dummies were included in the regressions but their coefficients are not reported in the table.

## 6. Conclusion

From the GSS data, I investigate how trust affects individuals' decision to participate in the labor market. By doing so, I try to reveal a channel through which trust promotes economic development, by arguing that a trust stock in the society motivates an individual to participate in the labor market, which increases the individual's income, and, in aggregate, the society's economic growth.

I use various econometric estimation methods in order to reveal the causality between trust and labor market participation. When trust is measured with a dummy variable whether an individual trusts in general, trust seems to be associated with the individual's labor market participation. Therefore, it implies that a trusting individual is more likely to work. The instrumental variable estimation results show that the inherited component of trust plays an important role in the individual's decision to participate in the labor market. The estimation results confirms the thought that trust is a complex capital that is formed over a long span of time, from generation to generation, which affect people's economic decisions.

Furthermore, I construct a pseudo-panel by grouping individuals with similar ages in the same region and averaging values over a 5-year interval from 1972 to 2010. From the OLS and fixed effects results, I find that the trust stock constructed at the cohort level does not play a significant role in determining the proportion of people in the labor market, but that the trust stock at the regional level is significantly associated with the proportion of people in the labor market. This does not violate the common sense that an individual is influenced by the trust level in the overall society, rather than by the trust level of their contemporaries in making a decision whether to work or not.

Although this study provides meaningful findings, it has limitations mainly due to data. As the survey provides respondents' residence only at the regional level, the stock of trust does not accurately reflect the trust level in the individuals' communities. If I can obtain more detailed information on the residence, I expect that estimating a more accurate impact of trust on the individual's labor market participation decision will be possible. Another limitation of this study is that we cannot exactly tell whether individuals actually face a decrease in motivation to work due to a distrusting environment. I only hypothesize that distrust increases costs for participating in the labor market based on the existing studies, but this cannot be confirmed with the data used in this paper. In order to find out, we need a survey or experiment that is designed to investigate the relationship between trust and individual's motivation to work, or a closer investigation of trust's impact on marginal and prime-age workers.

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## Appendix

**Table A1. The Regions in the United States**

Region 1	New England	Connecticut, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island
Region 2	Middle Atlantic	New Jersey, New York, Pennsylvania
Region 3	E. North Central	Wisconsin, Michigan, Illinois, Indiana, Ohio
Region 4	W. North Central	North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri
Region 5	South Atlantic	West Virginia, District of Columbia, Maryland, Delaware, Virginia, North Carolina, South Carolina, Florida, Georgia
Region 6	E. South Central	Kentucky, Tennessee, Mississippi, Alabama
Region 7	W. South Central	Texas, Oklahoma, Arkansas, Louisiana
Region 8	Mountain	Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Montana
Region 9	Pacific	Washington, Oregon, California, Alaska, Hawaii

**Table A2. The Correlations between the Key Variables**

	trust	atrust	itrust	education	male	age	labor	spouse' work status
trust	1							
atrust	0.45 (0)	1						
itrust	0.19 (0)	0.19 (0)	1					
education	0.02 (0)	0.06 (0)	0.22 (0)	1				
male	0.01 (-0.01)	0.01 (-0.07)	0.05 (0)	0.03 (0)	1			
age	-0.02 (0)	0.59 (0)	0.11 (0)	-0.08 (0)	0 (-0.77)	1		
labor	-0.01 (-0.02)	0.03 (0)	0.07 (0)	0.21 (0)	0.21 (0)	-0.07 (0)	1	
spouse' work status	0.04 (0)	0.09 (0)	0.08 (0)	0.06 (0)	-0.12 (0)	0.05 (0)	0.01 (-0.18)	1

\*Power in parentheses

\*trust: stock of trust in the region in the specific year. atrust: stock of trust at the agegroup level. itrust: individual's attitude of trust, educ: years of education, male: dummy =1 if male, spouse' work status: dummy = 1 if spouse is in the labor force.

**Table A3. Descriptive Statistics**

<b>Working Status</b>	<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>
Working full-time	trust	23824	.3725887	.0837506
	itrust	17647	.4012013	.4901555
	trusthc	20409	29.96384	10.20079
	educ	26706	13.49453	2.90216
	age	26756	39.62816	11.51763
	male	26756	.5608462	.4962932
	white	26756	.8130513	.3898776
	black	26756	.1339886	.3406465
	childs	26678	1.681385	1.599656
	slabor	26756	.3992749	.4897585
Working part-time	trust	4486	.3802381	.0825535
	itrust	3239	.4022847	.4904345
	trusthc	3838	30.48842	10.61557
	educ	4986	13.10489	2.773934
	age	4996	37.77882	13.33682
	male	4996	.2984388	.4576188
	white	4996	.8164532	.3871529
	black	4996	.1267014	.3326714
	childs	4988	1.725541	1.700403
	slabor	4996	.4257406	.4945043
Temporarily not working	trust	963	.3772134	.0837658
	itrust	705	.3886525	.4877902
	trusthc	840	30.87308	10.08106
	educ	1117	13.19606	2.989537
	age	1119	42.32261	12.07248
	male	1119	.4763181	.4996622
	white	1119	.8275246	.3779621
	black	1119	.1322609	.3389257
	childs	1115	1.901345	1.729236
	slabor	1119	.3190349	.466311
Unemployed or laid off	trust	1506	.3709451	.0826376
	itrust	1079	.2845227	.451396
	trusthc	1307	28.79012	11.14169
	educ	1726	12.0226	2.75156
	age	1731	37.02369	12.38193
	male	1731	.6452917	.4785631
	white	1731	.7071057	.4552219
	black	1731	.2229925	.4163736
	childs	1723	1.531631	1.703148
	slabor	1731	.1993068	.3995946

Retired	trust	1552	.3667907	.0834543
	itrust	1100	.4163636	.4931796
	trusthc	1338	31.17585	9.450055
	educ	1738	12.20483	3.554581
	age	1743	59.75043	5.980855
	male	1743	.6138841	.4869974
	white	1743	.842226	.3646335
	black	1743	.1376936	.344677
	childs	1739	2.384129	1.858548
	splabor	1743	.1967871	.3976842
Student	trust	1496	.3795014	.0811884
	itrust	1119	.3279714	.4696843
	trusthc	1284	29.18242	11.02205
	educ	1667	13.63287	2.351383
	age	1668	25.82134	8.635134
	male	1668	.4448441	.4970976
	white	1668	.7344125	.441778
	black	1668	.1744604	.3796187
	childs	1662	.6383875	1.272993
	splabor	1668	.1492806	.3564717
Keeping house	trust	5908	.3825383	.0902345
	itrust	4650	.3202151	.4666093
	trusthc	5203	29.90153	10.35588
	educ	6993	11.72444	2.742839
	age	7007	41.02155	13.25444
	male	7007	.0385329	.1924926
	white	7007	.7920651	.405859
	black	7007	.162409	.3688519
	childs	6995	2.594139	1.818264
	splabor	7007	.5772799	.494027
Other	trust	869	.3520929	.0778975
	itrust	644	.2189441	.4138521
	trusthc	673	29.12548	10.84193
	educ	936	11.49573	3.368934
	age	946	47.1871	12.11199
	male	946	.5295983	.4993872
	white	946	.7071882	.4552935
	black	946	.2336152	.423354
	childs	941	2.053135	1.983266
	splabor	946	.1871036	.390201
Total	trust	40604	.3745246	.0845007
	itrust	30183	.3783255	.4849774

trusthc	34892	29.99173	10.32873
educ	45869	13.03503	2.968442
age	45966	40.02465	12.81028
male	45966	.4509855	.4975972
white	45966	.8026585	.3979966
black	45966	.1444981	.3515979
childs	45841	1.821666	1.711966
splabor	45966	.398686	.4896332

\*trust: stock of trust.itrust: individual's attitude of trust, trusthc: % of people who trust in the ancestors' country, splabor: dummy = 1 if spouse is in the labor force

**Table A4. Marginal Effects of Probit Estimation from Table 2  
-Column (1)**

Probit regression, reporting marginal effects      Number of obs = 35998  
Log likelihood = -18426.971      Pseudo R2 = 0.1177

variable	dF/dx	Std. Err.	Z	P>z	x-bar	[ 95% C.I. ]
trust	.0941305	.0502431	1.87	0.061	.36833	-.004344 .192605
age	.0466473	.0012952	35.94	0.000	40.0902	.044109 .049186
age2	-.0005779	.0000152	-37.87	0.000	1766.69	-.000608 -.000548
male*	.1686366	.0046132	35.0	0.000	.448247	.159595 .177678
educ	.0236442	.0008729	26.96	0.000	13.252	.021933 .025355
married*	-.0126609	.0074732	-1.69	0.091	.535196	-.027308 .001986
childs	-.0187451	.0016495	-11.36	0.000	1.75013	-.021978 -.015512
splabor*	.0143403	.0074474	1.92	0.055	.388633	-.000256 .028937
otherace*	-.0138509	.0102485	-1.37	0.171	.062615	-.033938 .006236
black*	-.0456425	.0073513	-6.41	0.000	.142813	-.060051 -.031234
unempr~e	-.0047213	.0031878	-1.48	0.139	5.99152	-.010969 .001527

obs. P .7330963

pred. P .7583858 (at x-bar)

(\*) dF/dx is for discrete change of dummy variable from 0 to 1

z and P>z correspond to the test of the underlying coefficient being 0

Note: The results for region and year dummies not reported.

**-Column (3)**

Probit regression, reporting marginal effects      Number of obs = 25822

Log likelihood = -13171.619      Pseudo R2 = 0.1238

variable	dF/dx	Std. Err.	z	P>z	x-bar	[ 95% C.I. ]
itrust*	.032069	.0061092	5.19	0.000	.369181	.020095 .044043
age	.0471095	.0015414	30.5	0.000	40.0024	.044088 .050131
age2	-.0005844	.0000181	-32.21	0.000	1759.82	-.00062 -.000549
male*	.1730919	.0054851	30.26	0.000	.452831	.162341 .183843
educ	.0233852	.0010643	21.88	0.000	13.1827	.021299 .025471
married*	-.0045847	.0088531	-0.52	0.605	.54136	.021936 .012767
childs	-.0186805	.0019421	-9.62	0.000	1.76214	-.022487 -.014874
splabor*	.0027955	.0088361	0.32	0.752	.390287	-.014523 .020114
otherace*	-.0055422	.012341	-0.45	0.652	.059058	-.02973 .018646
black*	-.045413	.0087767	-5.34	0.000	.141933	-.062615 -.028211
unempr~e	-.0026107	.0035534	-0.73	0.463	6.01044	-.009575 .004354

obs. P .731082

pred. P .7576996 (at x-bar)

(\*) dF/dx is for discrete change of dummy variable from 0 to 1

z and P>z correspond to the test of the underlying coefficient being 0

Note: The results for region and year dummies not reported.

**Table A5. Marginal Effects of Probit Regression from Table 3**

Marginal effects after ivprobit

y = Probability of positive outcome (predict, p)

= .75896767

<b>variable</b>	<b>dy/dx</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt;z</b>	<b>[ 95% C.I. ]</b>		<b>X</b>
trust	.3016084	.1	3.02	0.003	.105606	.4976	-.002461
age	.0469984	.00143	32.86	0.000	.044195	.049801	40.2043
age2	-.0005821	.00002	-34.74	0.000	-.000615	-.000549	1777.9
male*	.1702871	.00505	33.69	0.000	.160381	.180193	.454618
educ	.0223636	.00099	22.69	0.000	.020432	.024296	13.3114
married*	-.0155381	.0081	-1.92	0.055	-.031417	.000341	.548419
childs	-.0182354	.00179	-10.19	0.000	-.021742	-.014729	1.75905
slabor*	.0047198	.00805	0.59	0.558	-.011067	.02050	.395333
otherace*	-.0031073	.01172	-0.27	0.791	-.026078	.019863	.056181
black*	-.0243565	.01013	-2.40	0.016	-.044208	-.004505	.136663
unempl	-.0054465	.0032	-1.70	0.089	-.011721	.000828	6.22329

(\*) dy/dx is for discrete change of dummy variable from 0 to 1

z and P>z correspond to the test of the underlying coefficient being 0

Note: The results for region and year dummies not reported.

**Table A6. First Stage Results for the IV Regression from Table 4**

Age	0.000472** (2.003)
Age2	-3.87e-06 (-1.374)
Sex	0.00166 (1.375)
Prime age	-0.000342 (-0.245)
Trust*male	0.906*** (79.94)
Trust*prime	0.00129 (0.0980)
Education	0.000670*** (5.106)
Married	-0.000137 (-0.124)
Children	-0.000150 (-0.598)
Spouse' work status	0.000449 (0.415)
Other race	-0.00446*** (-2.680)
Black	-0.0252*** (-16.89)
Unemployment rate	-0.000143 (-0.325)
ethnic	-0.0116*** (-3.768)
language	-0.00977*** (-3.217)
religion	-0.0620*** (-38.87)
Constant	0.0277*** (4.203)
Observations	29,957

z-statistics in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Wald test of exogeneity ( $\theta = 0$ ):  $\chi^2(1) = 11.13$  Prob >  $\chi^2 = 0.0008$

Note: Dependent variable is a trust variable that is orthogonal of GDP per capita of the ancestral country. Region and year dummies were included in the regressions but their coefficients are not reported in the table. Ethnicity, language, and religion are the variables that indicate degrees of ethnic, linguistic, and religious heterogeneity of the ancestral country.

## 요약

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본 논문에서는 미국의 General Social Survey 데이터를 이용하여 신뢰와 노동시장 참여의 관계를 분석한다. 미시 데이터를 활용하여 개인적 차원 분석으로 기존에 거시적 접근을 취한 연구보다 분석의 정교성을 높였으며, 도구변수법과 가패널(pseudo-panel) 추정법을 이용하여 분석 결과의 신뢰성을 제고했다. 논문의 결과는 개인 수준에서의 신뢰와 지역에서의 신뢰스톡은 노동시장 참여에 긍정적으로 영향을 주며, 특히 상속된 신뢰도 개인의 노동시장 참여에 긍정적인 영향을 준다는 것이다. 가패널 결과에 따르면 지역수준에서의 신뢰는 그 지역의 노동시장참여율에 긍정적인 영향을 주지만 또래집단수준의 신뢰는 유의미한 결과를 주지 못하는 것으로 나타났다.

**주요어 :** 사회적 자본; 신뢰; 노동시장; 도구변수 추정법; 가패널 분석

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